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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/673,188

09/30/2003

Hironobu Sai

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BUCHANAN, INGERSOLL & ROONEY PC
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EXAMINER

ARMAND, MARC ANTHONY

ART UNIT

PAPER NUMBER

2814

NOTIFICATION DATE

DELIVERY MODE

12/31/2007

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/673,188	Applicant(s) SAI ET AL.	
	Examiner MARC ARMAND	Art Unit 2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 October 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3,4 and 10-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,4 and 10-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>10/31/2007</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This application contains claims 5-9 drawn to an invention nonelected with traverse in the reply filed on 10/31/2007. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. **Claims 1, 3-4 and 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6898215 to Naone et al. in view of US 6716378 to Yang et al. of record.**

Regarding claim 1, Naone discloses a semiconductor light emitting device (LED) in fig. 1 and 7H-JA comprising: a mesa section (convex portion) having at least sandwich structure of an n-type clad layer 16, column 7 line 8, an active layer 18, column 5 line 46, and a p-type clad layer 20, column 5 line 47 and col. 6 line 43, which are constituted by compound semiconductor layers formed on a substrate 12, column 5 line 41; an insulating film 454, fig. 7G, of polyimide, column 13 lines 43-48, to cover the mesa section excluding a contact region 428, fig. 7H col. 13 line 51; and an insulating layer 464, col. 13 line 53, cover the insulating layer 454, fig. 7H.

But, Naone does not disclose the LED wherein the inorganic insulating film having a porous area defined by cylindrical vacancies, having vacancy rate of 50% or more while being oriented substantially in parallel with a surface of the substrate, and wherein the vacancies are arranged at periodic interval.

However, Yang discloses the inorganic insulating film having a porous area defined by cylindrical vacancies, having vacancy rate of 50% or more, col. 6 lines 32-35, while being oriented substantially in parallel with a surface of the substrate, col. 6 line 30, and wherein the vacancies are arranged at periodic interval, fig. 2A-5C. At the time the invention was made; it would have been obvious to one of ordinary skill in the art to use the inorganic layer teaching of Yang to replace the insulating layer 464 in Naone's device, because such insulating material would have produced a low dielectric constant, low-cost, non-toxic, and biodegradable inorganic dielectric material as taught by Yang in column 2 lines 38-40.

The 'vacancy' is being interpreted as a 'porosity' or 'holes' structure.

As for the statements "region, said inorganic insulating film obtained by a process comprising the steps of:

- a) generating a precursor solution containing a silica derivative and a surface active agent;
- b) Raising a temperature of the precursor solution and starting a crosslinking reaction;
- c) causing the precursor solution starting the crosslinking reaction at a precrosslinking step to come in contact with a surface of the substrate; and
- d) sintering the substrate with which the precursor solution comes in contact and decomposing and removing the surface active agent" are considered product by process. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777F, 2d 659, 698, 227 USPQ 964, 966 (Fed. Cir. 1985); see also MPEP 2113.

Regarding claims 13 and 3 Naone discloses a semiconductor light emitting device (LED) in fig. 1 and 7H-JA comprising: a mesa section (convex portion) having at

Art Unit: 2814

least sandwich structure of an n-type clad layer 16, column 7 line 8, an active layer 18, column 5 line 46, and a p-type clad layer 20, column 5 line 47 and col. 6 line 43, which are constituted by compound semiconductor layers formed on a substrate 12, column 5 line 41; an insulating film 454, fig. 7G, of polyimide, column 13 lines 43-48, to cover the mesa section excluding a contact region 428, fig. 7H col. 13 line 51; and an insulating layer 464, col. 13 line 53, cover the insulating layer 454, fig. 7H.

But, Naone does not disclose the LED wherein the inorganic insulating film having a porous area defined by cylindrical vacancies, having vacancy rate of 50% or more while being oriented substantially in parallel with a surface of the substrate, and wherein the vacancies are arranged at periodic interval and wherein the cylindrical are formed such that the cylindrical vacancies of adjacent porous structures are oriented in different directions.

However, Yang discloses the inorganic insulating film having a porous area defined by cylindrical vacancies, having vacancy rate of 50% or more, col. 6 lines 32-35, while being oriented substantially in parallel with a surface of the substrate, col. 6 lines 30, and wherein the vacancies are arranged at periodic interval, fig. 2A-5C. At the time the invention was made; it would have been obvious to one of ordinary skill in the art to use the inorganic layer teaching of Yang to replace the insulating layer 464 in Naone's device, because such insulating material would have produced a low dielectric constant, low-cost, non-toxic, and biodegradable inorganic dielectric material as taught by Yang in column 2 lines 38-40.

The 'vacancy' is being interpreted as a 'porosity' or 'holes' structure.

Yang also discloses an inorganic insulating film comprises a plurality of the porous structures, wherein the cylindrical are formed such that the cylindrical vacancies of adjacent porous structures are oriented in different directions, fig. 2A-5C col. 3 lines 8-20. At the time the invention was made; it would have been obvious to one of ordinary skill in the art to use the inorganic layer teaching of Yang to replace the insulating layer 464 in Naone's device, because such insulating material would have produced a low dielectric constant and low-cost inorganic dielectric material as taught by Yang in column 2 lines 38-40.

Regarding claims 4 and 10-12, Naone discloses the semiconductor light emitting device according to any of claims to 3, wherein the mesa section includes a surface emission structure having an electrode 428 in a top portion and comprises a semiconductor layer 20, provided with an active layer 18 having a quantum well structure, column 2 line 30, constituted by a compound semiconductor, and a pad 500, fig. 7J, to come in contact with the electrode 428 is provided on the insulating film 464.

With respect to "a sintered inorganic", the process limitations "a sintered inorganic" do not carry weight in a claim drawn to structure. In re Thorpe, 277 USPQ 964 (Fed. Cir. 1985).

Response to Arguments

6. The applicant argues that Yang's insulating film is not similar that the invention insulating layer and also he describe the process of making that layer.

The examiner respectfully traverse that argument because Yang discloses clearly an insulating layer and for the process of making that layer, it is considered product by process and Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by- process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even thought the prior product was made by a different process." In re Thorpe, 777F, 2d 659, 698, 227 USPQ 964, 966 (Fed. Cir. 1985); see also MPEP 2113.

The applicant argues that Yang fail to disclose an inorganic insulating film having cylindrical vacancies oriented in different directions.

The examiner respectfully traverses that argument because Yang discloses (col.6, line 26-35) cylinder polymer oriented in a certain direction. Moreover replacing the polyimide material of Naone with the mesoporous material of Yang would have provided a functional equivalent material, i.e. low dielectric constant and achieved the advantages and the function described above in claim 13 and 3 regarding the orientation of the cylindrical vacancies of the applicant's insulator. The material substitution would not destroy the intended purpose of Naone's device.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MARC ARMAND whose telephone number is (571)272-9751. The examiner can normally be reached on Monday - Friday between 9-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on 571-272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Marc-Anthony Armand
Examiner
Art Unit 2814

/Wai-Sing Louie/
Primary Examiner, Art Unit 2814

/M. A./
Examiner, Art Unit 2814